

REMARKS

The Examiner's action of July 27, 2004 is noted in which the claims are rejected under 35 USC 103 as being unpatentable over Kabler et al. in view of McConnell.

Upon review of the Kabler et al. and McConnell references, it became very clear that the combination of these references do not teach what ultimately worked in terms of shielding a GPS unit from signals at 1.5742 GHz right down the throat of the GPS receiver.

Applicant notes that GPS receivers have been fully shielded with a casing both front and back as is shown in the McConnell reference. This shielding, however, proved to be insufficient to shield the GPS receiver from signals in the air that interfered with the GPS receiver's being able to lock onto satellites.

Applicant found that by placing a very thick zinc shield between the phone motherboard and the GPS receiver to one side of the GPS receiver, whether it was shielded or not, one could knock down a significant portion of the interfering signals to the GPS receiver and that rather than taking 20 to 30 seconds to lock up on a so-called "hot start," the Garmin GPS receiver that was under test could be made to lock up in under nine seconds.

This was critical to the application of having the GPS receiver be turned on in an emergency situation, lock up and provide the location of the person in distress to the authorities. Most GPS receivers other than a Garmin would not even lock up on a hot start for 30 seconds to two minutes. This made putting a GPS receiver in the telephone handset untenable for the emergency purposes envisioned.

What is really unobvious about the claimed invention is that something placed to one side of the GPS receiver and not surrounding it would have the effect of shielding the GPS receiver from the interfering signals.

What was also clear is that one could not completely shield the entire system because one needed to have a GPS antenna exterior to the shield in order to be able to receive the GPS signals from the satellites. Moreover, it was also clear that one could not, for instance, readily shield the cell phone due to the orifices in its case due to the projection of the keypad through the cell phone body or the orifice used for the LCD display. Thus, while it might be thought that one could simply shield the cell phone motherboard from the GPS by completely surrounding it with a Faraday cage, this was not a feasible approach.

Without knowing the source of the interference to the GPS, it was nothing short of amazing that, by interposing this plate, one could actually get the GPS performance to improve.

Having at least been able to knock down the interference so that the GPS receiver could operate properly when encased in a cell phone, there was still a question as to where the interference was coming from. It was noted that, during drive time, GPS receivers in cars could not reliably get GPS signals. Testing revealed the following: Assuming that the cellular control channel is 832 MHz and considering that double 832 is 1664 MHz, then understanding that most cell phones have a 100 MHz up-convert or down-convert, subtracting 100 MHz from 1664 gives 1.574 GHz. What this means is that the cell phone-induced interference is almost right on top of the GPS frequency of 1.575 GHz.

It then became apparent that by providing this rather large shielding panel in the cell phone, it was able to knock down the 100 MHz component, thus explaining in part the success of this one-sided barrier.

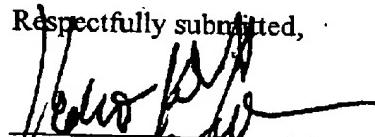
It will be seen in the Kabler et al. reference that while it does carry a GPS receiver there is no shielding of the type claimed. Moreover, with respect to the McConnell reference, there is no separate shielding on one side of the GPS as claimed.

Thus the combination of the references does not teach the claimed subject matter.

Nor would it be obvious to combine these two because when Applicant himself tested many shielded GPS receivers of the type having the McConnell casings, they could not lock up quickly enough to satisfy the E-911 requirements.

Allowance of the claims and issuance of the case are therefore earnestly solicited.

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